# 1
# INTRODUCTION

**TODO** Recent papers first. Mention Workshops instead in conference. "Procedings of XXXX". Add the pages in the papers list.

## 1.1 Background

**TODO** Motivate with the open challenges.

## 1.2 Problem statement

**TODO** Problem statement **TODO** Set the requirements as R1, R2, then map each contribution to them.

## 1.3 Automatic Software diversification requirements

1. **1:** **TODO** Requirement 1

## 1.4 List of contributions

**C1**: Methodology contribution: We propose a methodology for generating software diversification for WebAssembly and the assessment of the generated diversity.

**C2**: Theoretical contribution: We propose theoretical foundation in order to improve Software Diversification for WebAssembly.

**C3**: Automatic diversity generation for WebAssembly: We generate WebAssembly program variants.

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| Contribution | Research papers | | | | |
| --- | --- | --- | --- | --- | --- |
| | P1 | P2 | P3 | P4 | P5 |
| C1 | x | x | | x | x |
| C2 | x | x | | | |
| C3 | x | x | x | | |
| C4 | x | x | x | | |
| C5 | | | x | | |
| C6 | x | x | x | x | x |

**Table 1.1:** *Mapping of the contributions to the research papers appended to this thesis.*

**C4**: Software Diversity for Defensive Purposes:  We assess how generated WebAssembly program variants could be used for defensive purposes.

**C5**: Software Diversity for Offensives Purposes:  We assess how generated WebAssembly program variants could be used for offensive purposes, yet improving security systems.

**C6**: Software Artifacts: We provide software artifacts for the research community to reproduce our results.

   **TODO** Make multi column table

## 1.5   Summary of research papers

**P1**: Superoptimization of WebAssembly Bytecode.

**P2**: CROW: Code randomization for WebAssembly bytecode.

**P3**: Multivariant execution at the Edge.

**P4**: Wasm-mutate: Fast and efficient software diversification for WebAssembly.

**P5**: WebAssembly Diversification for Malware evasion.

## 1.6   Thesis outline